Problem 1
Derive Eq. 4.2.17. Show your work in detail.

Problem 2
Using the matrix formulation, prove that the radii of curvature of the input and output waves are related by Eq. 4.2.19. Show your work in detail.

Problem 3
Use the matrix formulation of geometric optics to find the position of the image of an object which is placed in air 15 cm from the end of a very long rod of glass with a convex spherical end of radius 5 cm. Use 1.5 as the refractive index of the glass.

Problem 4
Problem 4.5 from your textbook.

Problem 5
In the same figure, plot the power transmission of a monochromatic wave of wavelength of 500 nm through a Fabry-Perot interferometer (FPI) as a function of the length of FPI for the following mirror power reflectivity: 0.1, 0.9, 0.99 and 0.999. Assume that the FPI mirrors have the same power reflectivity, its length is changed from 1 cm to 1.00004 cm, and the light incident angle is zero.